

Application No.: 10/683,618

Amendment dated February 25, 2005

Replacement claim listing in reply to original Office action of October 18, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (original): An electrical switch, comprising:
a magnetic coupler layer, with a top and a bottom surface, characterized by at least one opening;
a magnetic flexible layer, with a top and a bottom surface, characterized by at least one flexible armature;
a magnetic attractive force between the magnetic coupler layer and the magnetic flexible layer;
a magnetic attractive force between the magnetic coupler layer and the at least one flexible armature such that the bottom surface of the magnetic coupler layer is normally magnetically coupled to the at least one flexible armature;
at least one actuation member that is capable of passing through the at least one opening such that the at least one flexible armature may be manipulated by a switch user;
a bottom layer;
at least one debossed spacer means formed in the magnetic flexible layer so that the bottom surface of the magnetic flexible layer is substantially supported above the bottom layer to create at least one armature cavity for the at least one flexible armature; and
at least one set of electrical conductors capable of switching between an electrically opened and an electrically closed position when the switch user manipulates the at least one flexible armature.

Claim 2 (original): The electrical switch of claim 1 wherein the at least one actuation member is an embossed crown formed in the at least one flexible armature.

Claim 3 (original): The electrical switch of claim 2 further comprising markings, such as printing or painting, on that surface of the embossed crown that will be visible to the switch user.

Claim 4 (original): The electrical switch of claim 1 further comprising an electrically conductive material that at least partially covers the at least one flexible armature, and wherein the at least one set of electrical conductors is formed on the bottom layer such that the electrical switch is electrically closed by the electrically conductive material when the switch user manipulates the at least one flexible armature away from the normally magnetically coupled position.

Claim 5 (original): The electrical switch of claim 1 further comprising a thin sheet of durable material that is adhesively fixed to the bottom of the flexible magnetic layer before the at least one flexible armature and the at least one debossed spacer means are formed in the flexible magnetic layer.

Claim 6 (original): The electrical switch of claim 1 wherein the at least one set of electrical conductors are arranged between the bottom surface of the magnetic coupler layer and the at least one flexible armature such that the electrical switch is electrically closed when the at least one flexible armature is in the normally magnetically coupled position.

Claim 7 (original): The electrical switch of claim 1 wherein the bottom layer is a membrane switch assembly.

Claim 8 (currently amended): The electrical switch of claim 1 wherein the magnetic coupler layer and the magnetic flexible layer are substantially the same size, and these two layers are substantially housed within a casing of an electronic device such that the two layers are properly positioned over the bottom layer when the electronic device is fully assembled.

Claim 9 (withdrawn): A method of making an electrical switch, comprising the steps of,

making a magnetic coupler layer, with a top and a bottom surface, out of sheet magnet;

forming at least one opening in the magnetic coupler layer;

making a magnetic flexible layer, with a top and a bottom surface, out of a magnetic receptive rubber;

cutting at least one flexible armature into the magnetic flexible layer;

securing the magnetic coupler layer to the magnetic flexible layer using the magnetic attractive force between the layers;

holding the at least one flexible armature against the bottom surface of the magnetic coupler layer using magnetic attractive force so that the flexible armature is in a normally magnetically coupled position that is at least partially below the at least one opening;

providing at least one actuation member that is capable of passing through the at least one opening such that the at least one flexible armature may be manipulated by a switch user;

forming at least one spacer means;

placing the magnetic flexible layer over a bottom layer;

using the spacer means to support the bottom surface of the magnetic flexible layer substantially above the bottom layer such that at least one armature cavity for the at least one flexible armature is formed; and

forming at least one set of electrical conductors capable of switching between an electrically opened and an electrically closed position when the switch user manipulates the at least one flexible armature.

Claim 10 (withdrawn): The method of claim 9 further comprising the step of installing the magnetic coupler layer and magnetic flexible layer in an electronic device casing such that these layers are substantially secured in proper alignment with the bottom layer.

Claim 11 (withdrawn): The method of claim 9 further comprising the step of forming a top layer that is magnetically attracted to the magnetic coupler layer, the top layer including the at least one actuation member.

Claim 12 (withdrawn): An assembly of electrical switches, comprising;
a magnetic coupler layer, with a top and a bottom surface, characterized by an arrangement of openings;
a magnetic flexible layer, with a top and a bottom surface, characterized by an arrangement of flexible armatures;
a magnetic attractive force between the magnetic coupler layer and the magnetic flexible layer;
a magnetic attractive force between the magnetic coupler layer and the flexible armatures such that the bottom surface of the magnetic coupler layer is normally magnetically coupled to the flexible armatures;
actuation members that are capable of passing through the openings such that a switch user may manipulate the flexible armatures;
a bottom layer;
a spacer means that supports the magnetic flexible layer above the bottom layer such that there are armature cavities for the flexible armatures; and

an arrangement of electrical conductors that enables a switch user to selectively manipulate electrical circuits connected to the assembly of electrical switches such that, actuation of one of the flexible armatures electrically opens or electrically closes a specific electrical circuit.

Claim 13 (withdrawn): The assembly of claim 12 wherein the actuation members are embossed crowns formed in the flexible armatures.

Claim 14 (withdrawn): The assembly of claim 12 further comprising an electrically conductive material that at least partially covers the flexible armatures, and wherein the electrical conductors are formed on the bottom layer such that one of the electrical switches is electrically closed by the electrically conductive material when the switch user manipulates one of the flexible armatures away from the normally magnetically coupled position.

Claim 15 (withdrawn): The assembly of claim 12 further comprising a thin sheet of durable material that is fixed to the bottom of the flexible magnetic layer before the arrangement of flexible armatures is formed in the flexible magnetic layer.

Claim 16 (withdrawn): The assembly of claim 12 wherein the electrical conductors are arranged between the bottom surface of the magnetic coupler layer and the flexible armatures such that one of the electrical switches is electrically opened when the switch user manipulates one of the flexible armatures away from the normally magnetically coupled position.

Claim 17 (withdrawn): The assembly of claim 12 wherein the bottom layer is a membrane switch assembly.

Claim 18 (withdrawn): The assembly of claim 12 wherein the magnetic coupler layer and the magnetic flexible layer are substantially housed within a casing of an electronic device such that the layers are positioned over the bottom layer when the electronic device is fully assembled.

Claim 19 (withdrawn): The assembly of claim 12 wherein the actuation members are formed into an elastomer top layer that is positioned over the magnetic coupler layer; the elastomer top layer is held in position by a faceplate having apertures for buttons formed in the elastomer above each of the actuation members; and the faceplate is secured to a casing that at least partially supports the bottom layer.

Claim 20 (withdrawn): The assembly of claim 12 wherein the magnetic coupler layer is a permanent magnet material, and the magnetic flexible layer is a magnetic receptive rubber.

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